



Smart
Energy
Systems
ERA-Net

Spotlight

WG RaMD 2021



CLUE

EVA

Flexi-Sync

SONDER



SONDER



More info on [expera](https://www.expera.eu)



ERA-Net SES has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039, 775970 and 883973.

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ERA-Net SES Projects' Perspectives on



- Protection of consumer rights and data
- Security of supply in CECs and RECs
- Quality of service through digitalisation

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Building on „Regulatory Aspects of Self- Consumption and Energy Communities” by CEER

CEER

Council of European
Energy Regulators



Fostering energy markets, empowering consumers.

Customers and Retail Markets and Distribution
Systems Working Groups

Regulatory Aspects of Self-
Consumption and Energy Communities

CEER Report

Ref: C18-CRM9_DS7-05-03
25 June 2019

Council of European Energy Regulators asbl
Cours Saint-Michel 50a, Box E – 1040 Brussels, Belgium
Arrondissement judiciaire de Bruxelles – RPM 0861.035.445



Protection of consumer rights and data in innovative energy transfer approaches

“Consumers’ basic rights should also be protected when consumers are part of an energy community offering flexibility or consumption management.” (*Regulatory Aspects of Self-Consumption and Energy Communities, page 24*)

“Innovative energy community projects have proven that they can be at the forefront of the digitalisation of the electricity sector, for example by trialing technologies such as blockchain to certify peer-to-peer energy transfers.” (*Regulatory Aspects of Self-Consumption and Energy Communities, page 31*)

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CLUE



- supports both statements
- argues that there exists a tension between new, useful technologies for energy trading and billing in communities and necessary privacy protections
- Points out that blockchain technology, with its advantages in transparency, security, and validation, needs to be closely considered in terms of privacy of community participants

Further resources
www.project-clue.eu

SONDER



- agrees with the statements and think that energy communities are an important vehicle to trial innovative technologies
- as consumers’ basic rights and especially data protection are fundamental requirements, it is a necessity that these new technologies are compliant

Further resources
www.project-sonder.eu

EVA



- argues that flexibility, consumption management and optimal control of the SG infrastructures require SoA digitalisation technologies of the electricity sector, involving data security/privacy (mobility data) and transactions transparency provision through new technologies, such as blockchain, but, also, require new SG and data management protocols and standardisation

Further resources
www.evaproject.eu

Joint Conclusions



The projects agree on the importance of enabling innovative technologies, at the forefront of the digitalisation of the power sector, as well as the need to safeguard consumers’ basic rights, especially in terms of data protection. ECs are a suitable environment for trialing new technologies useful for energy trading and billing: related to this, the blockchain technology shows many advantages, but needs to be closely considered in terms of privacy of community participants.



Security of supply in CECs and RECs

“CECs generally strive to provide the same or a higher level of local quality and security of supply as DSOs.” (*Regulatory Aspects of Self-Consumption and Energy Communities, page 32*)

WG RaMD

Flexi-Sync



- supports the statement, although would extend it to include RECs
- reports that in a stakeholder workshop security of supply was one of the most mentioned points in regard to the future energy supply
- focuses on the integration of the local district heating grid with the electricity grid to exploit flexibilities and synergies. Blackout security, self-sufficiency and as minimal comfort losses as possible (e.g., concerning heating in buildings) were prevalent in discussions

Further resources: www.flexisync.eu

SONDER



- agrees with the statement and point out that ECs should also consider regional requirements and take part in providing overall grid stability
- points out that, due to the proximity constraint for RECs, RECs are more suitable for this task
- argues that grid stability must always have higher priority compared to market activities and corresponding actions. In order to have a positive effect on overall grid stability, the focus of attention needs to be broadened, taking into account also regional requirements and above all the distribution network structure and its limitations

Further resources: www.project-sonder.eu

Joint Conclusions



The projects agree that ensuring local quality and security of supply is one of the main aims of energy communities. Security of supply should go beyond the power sector, to include other energy carriers, such as heat. In order to have a positive effect on overall grid stability, the focus needs to be broadened to embrace not only local, but also regional requirements. Due to the proximity constraint for RECs, RECs are more suitable for this task.



Improving quality of service through digitalisation

“If a network is managed by a community led enterprise, the quality standards need to remain at the same level as those of a comparable DSO. Quality of service also incorporates increasing levels of digitalisation and advanced data provision, both for settlement and for enabling access to new markets including those for flexibility. Innovative energy community projects have proven that they can be at the forefront of the digitalisation of the electricity sector, for example by trialing technologies such as blockchain to certify peer-to-peer energy transfers. In cooperating with other DSOs, as well as market participants, CEC’s relying on innovative technology to operate a grid will need to ensure a level of data quality and reliability that is in line with current best practice. (*Regulatory Aspects of Self-Consumption and Energy Communities, page 31*)



WG RaMD



Perspective

- supports this statement, since only advanced level of reliable digitalisation tools could provide the means for successful management of cooperation in the reliable operation of the grids
- points out that open data techniques and blockchain technologies are in line with these demands

EVA

About

- in the project, which is related to the optimisation of regional infrastructures for the transition to Electric and connected Autonomous Vehicles, provision of warranted quality of service is of utmost importance.
- this requires improved SoA digitalisation tools, cooperation of DSOs as well as market participants, relying on innovative technology to reliably operate the grids within current standards

Further resources

www.evaproject.eu



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ZEHTC

More info on [expera](#)



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ERA-Net SES Projects' Perspectives on



Decentralised flexibility provided via market-based mechanisms

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Building on „Recommendations on Selected Regulatory Issues: from experience and knowledge” by BRIDGE



Cooperation between Horizon 2020 Projects in the field
of Smart Grids and Energy Storage

**Recommendations on Selected
Regulatory Issues from experience and
knowledge**

Regulations Working Group

July 2019

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DSO should be allowed to contract flexibility via market-based mechanisms

“Within this new market context, new services are developed and offered to or by system operators. In order to guarantee an efficient provision of new services, roles of system operators should be enlarged. In particular, the evolving role of the DSO is relevant for the emergence of certain services and related business models. [...] DSO should be allowed to contract flexibility via market-based mechanisms. Network remuneration fees should treat the procurement of energy flexibility at the same level as alternative solutions such as network reinforcements. It is proposed that the remuneration should be based on the avoided costs.” (*Recommendations on Selected Regulatory Issues: from experience and knowledge, page 11*)



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Perspective

- supports the statement, as it will accelerate introduction of hydrogen in the energy systems
- in fact, investment in hydrogen production and storage is a flexibility measure both for the local grid and for transmission of energy, but a business case can hardly be motivated on existing energy market conditions
- points out that in countries where hydrogen is intended to support national transmission grids by using existing gas networks the TSO may also be included in the considerations

ZEHTC

About

In ZEHTC hydrogen is demonstrated to be viable to replace fossil fuels in power production in gas turbines. The intermediate storage of hydrogen increases the flexibility of local power grids.

Further resources

www.zehtc.org



Smart Energy Systems ERA-Net

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CLUE, Flexi-Sync, FlexSUS, REDAP, RegEnergy, SONDER

More info on [expera](#)



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ERA-Net SES Projects' Perspectives on



- Proximity in ECs
- Regulation of energy sharing
- Charges within ECs
- Size of the EC
- Legal security for existing ECs
- Financial profits within ECs
- Peer-to-peer trading
- Innovative concepts of regulatory sandbox programmes in the EU

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Building on „Energy Communities under the Clean Energy Package“ by REScoop and ClientEarth

RESCOOP.EU



Energy Communities under the Clean Energy Package

Transposition Guidance



“Electrical” versus geographical proximity in Energy Communities

“We recommend that Member States use their discretion to adopt an expanded geographical scope for renewables self-consumption, as it allows for greater and more equitable uptake by individuals and jointly-acting consumers that use suitable land or rooftops nearby for renewables production.” (*Energy Communities under the Clean Energy Package, page 70*)

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CLUE



- describes the Austrian approach, which foresees the introduction of 'local' RECs (electricity transfer through the LV grid) and 'regional' RECs (electricity transfer may include the MV grid)
- grid tariff reductions are higher for ECs on the LV grid

Further resources
www.project-clue.eu

REDAP



argues that it would be beneficial to aggregate consumer details within each GIS polygon and to link this statement to the subject of financial incentives and subsidies which enable such generation activity

Further resources
www.redap.eu

RegEnergy



- argues that proximity should relate to electricity meters behind specific substations, in order to maximise supply and demand balancing
- the advantages to the grid can be reflected in incentive mechanisms
- agrees with the original French decree

Further resources
www.nweurope.eu/projects/regenergy

SONDER SONDER



- argues that restricting an EC to only one transformer station may endanger potential and benefits of ECs
- suggests that ECs be allowed to stretch across multiple substations
- supports combining "electrical" and geographical proximity

Further resources
www.project-sonder.eu

Joint Conclusions




The projects express different perspectives regarding the definition of “proximity” in ECs. Anyway, they agree that in conditions of “electrical proximity” supply and demand balancing could be maximised. The combination of electrical and geographical proximity can be a viable solution and multiple configurations of ECs should be allowed.



Regulation of energy sharing


“We recommend Member States take an open and innovative approach and allow different models of energy sharing.”
 “Therefore, we recommend that Member States consider to include community-owned peer-to-peer trading platforms in their energy sharing frameworks, which also allow for individual renewables self-consumers and generators to participate.”
 “We recommend that Member States look at the above approaches for addressing potential registration and licensing issues experienced by energy communities’ in relation to Differentiation, Reduced/simplified burden, Flexibility and Capacity building support.” *(Energy Communities under the Clean Energy Package, pages 75, 77, 83)*

WG RaMD

RegEnergy 


- considers Peer to Peer sharing as potential vehicle to facilitate prosumers to engage with the market and integrate RES locally to suit their aggregated demand
- these communities (JARSC, REC, CEC) would have a legal standing and designation within the market in order to regulate their relations with the grid

Further resources
www.nweurope.eu/projects/regenergy

Flexi-Sync 

- points out that a focus still needs to be put on regulation of renewable heat within RECs (see the Austrian case)
- argues that incentives need to be placed to make local heating networks more flexible
- increased interconnection of heat and power sectors can drive the integration of RES while reducing the stress on power grids

Further resources
www.flexisync.eu

SONDER 

- supports the integration of multiple approaches of energy sharing
- energy sharing should not be restricted to just one approach but rather allow individual solutions
- these solutions should meet minimal requirements such as not endangering grid stability

Further resources
www.project-sonder.eu

Joint Conclusions 

There is a wide consensus that regulation of energy sharing needs to be dynamic and flexible, adapting to country-specific developments, but security of supply needs to remain a key priority. Peer to Peer (P2P) sharing mechanisms can be the vehicle to facilitate prosumers to engage with the market and integrate renewable energy technologies locally. A focus still needs to be put on the regulation regarding renewable heat within renewable energy communities.



Charges within Energy Communities

“We recommend that Member States consider approaches to different or simplified regulatory treatment of energy communities based on the results of their assessment of national potential and existing barriers to the development of RECs under Article 22(3).”

“We recommend that policies and regulations on network charges are developed in a comprehensive manner, not just including energy communities but other types of active customers and distributed energy resources (DER).”

“We recommend that the responsible authority to conduct a DER cost-benefit analysis should be an independent body with energy market expertise, in particular the national energy regulatory authority.’ & ‘We recommend that Member States write into national legislation transposing the IEMD and REDII a duty for the national regulatory authority or another independent, accountable, specialised agency to conduct a DER cost-benefit analysis”. (*Energy Communities under the Clean Energy Package, pages 86, 89, 93*)

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RegEnergy



- argues that ECs must have a financial incentive to prompt prosumers and consumers to engage such that they can emerge and realise the advantages they bring to the wider grid
- proposes a mixture of the Italian and Irish solutions where energy communities, as legal entities have a set tariff for shared energy that remains within the EC cluster

Further resources

www.nweurope.eu/projects/regenergy

CLUE



- stresses that a financial profit for members is essential (although not the main goal) to make renewable ECs prosper
- models show that financial gain is highly dependent on ownership of RES generation, sizes of EC RES generation plants and load profiles
- investigates different use cases and their profitability in a continuous way, as required by the constant development of the grid tariff structure

Further resources

www.project-clue.eu

SONDER



- argues that sustainable tariff design shall be able to cover any situation imaginable, even a rather unrealistic reversion of the tariff accumulation in case big power plants could one day all be replaced by DER
- any energy purchased from or sold to a wholesale energy trader shall be charged the full grid tariffs, because these commonly use all grid levels

Further resources

www.project-sonder.eu

Joint Conclusions



The projects agree that incentives are needed to prompt citizens’ engagement. Different models can be adequate for different situations. Special grid tariffs for shared energy and valuing the energy surplus of a community at wholesale market rates could be valid support schemes. Also, auctions dedicated to RECs and specific tariffs for the energy they produce are possible options. This logic should ideally be applied also to heat.



Size of the Energy Community

“On 1 March, 2020, law n.8/2020 came into force in Italy, which aims at early transposition of Articles 21 and 22 of the REDII. In particular, the legislation introduces a legal framework for collective self-consumption and for energy sharing by RECs. [...]. For energy sharing by RECs, participation in the REC may not constitute a SMEs main commercial or industrial activity. Total installed production cannot exceed 200 kW”. (*Energy Communities under the Clean Energy Package, pages 76*)



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Perspective

- expresses the opinion that a cap on installed capacity will significantly affect the impact that ECs can have on the Clean Energy Transition. If ECs are recognised as legal entities, they have an authority to trade with the market and apply set government rules that must be maintained to qualify for its license
- argues that a renewable energy system can be designed to suit this aggregated demand with P2P sharing incorporated and that an MEC can be applied to this community based on local grid capacities similar to other generators

RegEnergy

About

RegEnergy project recommends that caps are applied to a communities MEC as opposed to installed capacity.

Further resources

www.nweurope.eu/projects/regenergy



Legal security for existing Energy Communities

“First, decision makers should be aware of any legal forms already in use by existing energy communities. To ensure continuity for such initiatives, we recommend that national legislation ensure existing energy communities are included in whichever national level definition is created.” (*Energy Communities under the Clean Energy Package, pages 15*)



WG RaMD



CLUE & SONDER

Perspective

- notice that some initiatives promote themselves as (energy) communities but may not fit the EU directive definitions of energy communities
- state that, before discussing the legal forms etc., it should be checked if an initiative is an energy community according to the EU directive definitions at all

Further resources

www.project-clue.eu

www.project-sonder.eu



Financial profits within Energy Communities

“The definition does not prohibit RECs or CECs from providing a return on investment to its members. However, returns on investment and other financial benefits to members should be secondary to other general aims of the community. This would, for instance, exclude industrial or commercial consumers from setting up a REC or CEC simply to reduce energy costs, because their operational expenditures for energy contribute to their overall profit structure”. (*Energy Communities under the Clean Energy Package, pages 18*)



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SONDER

Perspective

- agrees that Return on Investment and other financial benefits to members should be secondary to other general aims of the community, but they are the most important factors for the large mass
- states that, although reducing energy costs by being part of an EC may be the main aim of industrial or commercial consumers, it should not exclude them from being part of an energy community, as long as the main aims of the energy community are not compromised

About

SONDER suggests that the participation of industrial or commercial consumers in a REC or CEC, its advantages and disadvantages, is subject to further research and considered in cost-benefit-analysis.

Further resources

www.project-sonder.eu



Peer-to-peer trading

“The definition does not prohibit RECs or CECs from providing a return on investment to its members. However, returns on investment and other financial benefits to members should be secondary to other general aims of the community. This would, for instance, exclude industrial or commercial consumers from setting up a REC or CEC simply to reduce energy costs, because their operational expenditures for energy contribute to their overall profit structure”. (*Energy Communities under the Clean Energy Package, pages 18*)



Perspective

- states that peer-to-peer trading is a possible way to realise energy sharing in this context.
- argues that the definition of peer-to-peer trading according to the REDII as “the sale of renewable energy” is incorrect in the Guidance. The REDII does not define “peer-to-peer trading” but rather “peer-to-peer trading of renewable energy” (see Art. 2 (18))

CLUE

About

CLUE is looking at possible ways to realise energy sharing (which is a main activity of the EC). For example, in one Austrian demo region blockchain technology is used as building block

Further resources

www.project-clue.eu



Innovative concepts of regulatory sandbox programmes in the EU

“We recommend Member States consider providing a regulatory sandbox programme that is accessible to energy communities (where they do not already have one).” (*Energy Communities under the Clean Energy Package, pages 18*)

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CLUE



- argues that one of the major hurdles to new innovations in energy and specifically electricity sector is not being able to demonstrate it due to current regulations
- points out that regulatory sandbox can address this issue by easing regulation in a certain section of the community: this will significantly reduce time-to-market and innovations can climb the TRL ladder faster

Further resources
www.project-clue.eu

SONDER



- argues that without sandboxes disruptive solutions cannot be tested in the field: the system is prevented from sound evolution by some overly strict regulations
- sandboxes enable a practical evaluation of regulations and necessary changes thereof
- states that sandboxes and sufficient funding for vendor-agnostic testing of R&D results and novel products in real settings are needed

Further resources
www.project-sonder.eu

REDAP



- points out that sandboxes could reveal valuable insights and scenarios: this requires considerable engagement, testing, feedback, knowledge sharing and education
- recommends the exploration of the possibilities for sandboxing according to the concept of “digital-twinning”
- recommends the use of geographic information systems and workflows to develop digital sandboxes

Further resources
www.redap.eu

Joint Conclusions



The projects agree that slow development of innovations in the energy business may result from not being able to demonstrate novelties due to regulations in force. Regulatory sandboxes can address this issue by enabling exceptions. Innovative concepts need to be investigated. The concept of ‘digital-twinning’ is a promising possibility for sandboxing to be explored. Where a realistic digital-twin of a grid section exists, possible effects of eased regulations can be explored without risking grid stability.

WG RaMD 2021



**CLUE, DISTRHEAT, Flexi-Sync,
FlexSUS, MatchIT, REgions, TOP-
UP, ZEHTC**

More info on [expera](https://www.expera.eu)



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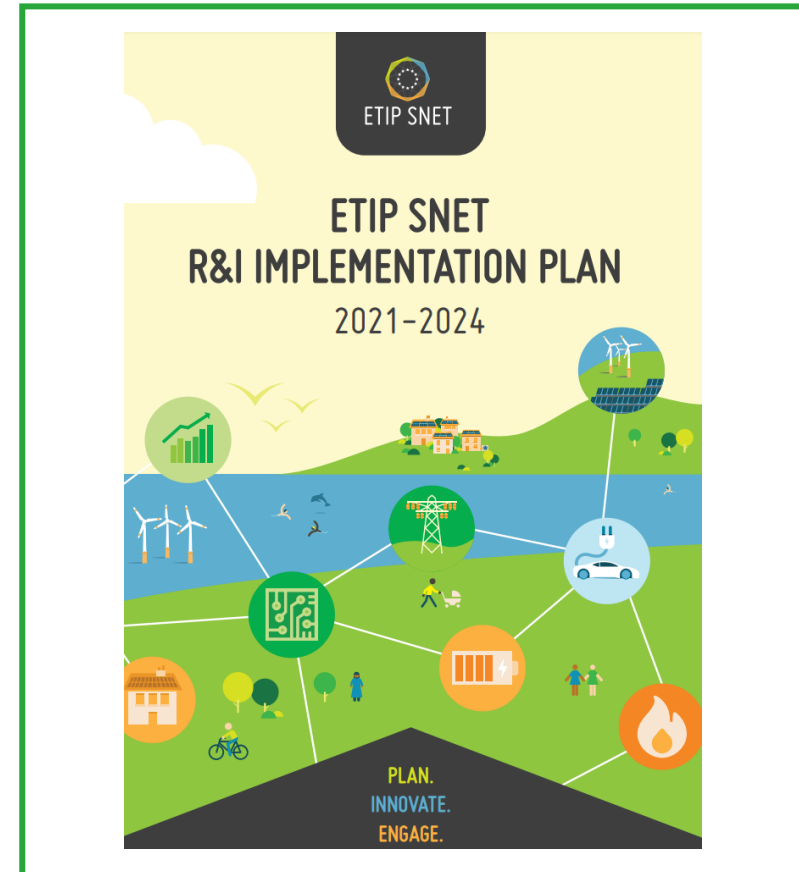
ERA-Net SES Projects' Perspectives on



- All sources of flexibility must be employed along the entire value chain
- Need for better appreciation of demand flexibility

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Building on „ETIP SNET R&I Implementation Plan 2021-2024” by ETIP SNET






All sources of flexibility must be employed along the entire value chain


“A paradigm shift is needed in the management of the energy system in front of all uncertainties, to guarantee the stability and efficiency of the system at all time and geographical scales. All sources of flexibility must be employed along the entire value chain“. (ETIP SNET R&I Implementation Plan 2021-2024, page 85)

WG RaMD

DISTRHEAT



- describes the Austrian approach, which foresees the introduction of 'local' RECs (electricity transfer through the LV grid) and 'regional' RECs (electricity transfer may include the MV grid)
- grid tariff reductions are higher for ECs on the LV grid

Further resources
www.distrheat.eu

Flexi-Sync



- agrees with the needed paradigm shift
- investigates a wide variety of flexibility options and their potential in DHC networks
- argues that, to reach full decarbonisation, flexibility potentials must be used across domains. Flexi-Sync is testing this sector coupling

Further resources
www.flexisync.eu

REgions



- fully supports the statement
- aims at demonstrating that there is untapped potential of vRES
- in addition to vRES VPPs balancing services to the TSO, includes redispatch and voltage control in the demonstration

Further resources
www.regions-project.info

ZEHTEC


- agrees with statement
- it is needed to develop market models to drive cost-effective demand related investments
- remuneration in multiple flexible markets is necessary
- states that the use in different sectors of flexible fuels such as hydrogen should be investigated

Further resources
www.zehtc.org

Joint Conclusions


The projects agree on the need of a paradigm shift to use flexibility potentials across domains and throughout the entire energy system. In order to fully achieve this, focus needs to be put on proper regulation, sector coupling and market models.



Need for better appreciation of demand flexibility

“The present demand-related technologies, market models and integrated energy system policies do not provide sufficient features and incentives to the customer/prosumer, to engage in DSM and DR programs and market initiatives. There is also a lack of knowledge about customers behaviour and motivation to involve them in the energy markets.” (ETIP SNET R&I Implementation Plan 2021-2024, page 85)

WG RaMD

CLUE



- highlights that little research has been done investigating how these technologies could be employed and what flexibility potential they would hold
- aims to innovating the use of technology for new purposes
- bring new structures for tariffs to the demonstration cases to investigate their effects on flexibility potential in an innovative co-creation methodology between DSO, solutions provider, end-user

Further resources
www.project-clue.eu

FlexSUS



- argues that the main purpose of flexibility in a given context should be clearly defined to offer the right set of market or incentive options to trigger it
- flexibility should be addressed in a systemic way, considering also the flexibility options arising with smart sector coupling
- states that a focus still needs to be put on the regulation regarding renewable heat within RECs

Further resources
www.flexsus.org

Match-IT & TOP-UP



- states that energy demand should not be considered as a constant, but more dynamic and adjustable (more research)
- focus on citizen involvement, on how their energy demands can be better understood, predicted and changed to improve modelling and functioning of local energy systems (through value-driven incentives)

Further resources
www.matchit.info
www.top-up.info

Joint Conclusions



The projects consider that policy makers should use a holistic view when they design policies. Currently, energy systems are regulated in silos and ignore possible synergies related to flexibility and to the development of sustainable multi-energy carriers. Policymakers should prioritise the establishment of such level playing field, adding to the flexibility portfolio new resources, and then let market signals activate these resources in a cost-effective way.

Funding Partners



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ADEME



Agence de l'Environnement et de la Maîtrise de l'Energie



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